Notice No. 5

Rules and Regulations for the Classification of Naval Ships, January 2014

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Issue date: December 2014

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Volume 3, Part 1, Chapter 1, Sections 1 & 2	1 January 2015
Volume 3, Part 1, Chapter 2, Section 1	1 January 2015
Volume 3, Part 1, Chapter 3, Section 1	1 January 2015
Volume 3, Part 1, Chapter 4, Sections 1, 3, 4 & 5	1 January 2015
Volume 3, Part 1, Chapter 5, Sections 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 & 13	1 January 2015
Volume 3, Part 1, Chapter 6, Sections 1 & 2	1 January 2015
Volume 3, Part 2, Chapter 1, Sections 1, 2, 4, 5 & 8	1 January 2015
Volume 3, Part 2, Chapter 2, Sections 1, 2 & 3	1 January 2015
Volume 3, Part 2, Chapter 3, Sections 1, 2 & 7	1 January 2015
Volume 3, Part 3, Chapter 1, Sections 1, 2, 4 & 6	1 January 2015
Volume 3, Part 3, Chapter 2, Sections 3, 7 & 8	1 January 2015
Volume 3, Part 3, Chapter 3, Sections 3 & 4	1 January 2015
Volume 3, Part 3, Chapter 4, Sections 3, 4, 5 & 6	1 January 2015
Volume 3, Part 3, Chapter 5, Sections 1 & 3	1 January 2015
Volume 3, Part 3, Chapter 6, Section 3	1 January 2015

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Volume 3, Part 1, Chapter 1

Ice Navigation – First Year Ice Conditions

Effective Date 1 January 2015

■ *Section 1*

General requirements

1.2 ~~Plans and information~~ Documentation required for design review

■ *Section 2*

Hull strengthening requirements

2.2 Definitions, *see* Fig. 1.2.1

2.2.1 The **Ice Deep Waterline** corresponds to the Deep Draught Waterline. Where specially requested ~~and where permitted by the Naval Authority~~, an Ice Deep Waterline may be specified which differs from the foregoing, but corresponds to the deepest condition in which the ship is expected to navigate in ice. *See* Vol 1, Pt 3, Ch 1,5.3 for margins.

Volume 3, Part 1, Chapter 2

Integrated Propulsion Systems

Effective Date 1 January 2015

■ *Section 1*
General requirements

1.1 Application

~~*1.1.6* Requirements additional to those in this Chapter may be imposed by the Naval Authority.~~

1.2 ~~Plans~~ Documentation required for design review

1.2.3 ~~**System operational concept**~~ System Operational Concept. A System Operational Concept document covering the Power and Propulsion system, including a description of how the control, alarm and safety systems for the integrated propulsion system provide effective means for operation and control during all ship operational conditions.

Volume 3, Part 1, Chapter 3

Propulsion and Steering Machinery Redundancy

Effective Date 1 January 2015

■ *Section 1* General requirements

1.1 General

~~*1.1.5* Requirements additional to these Rules may be imposed by the Naval Authority.~~

Existing paragraphs 1.1.6 *to* 1.1.9 *have been renumbered* 1.1.5 *to* 1.1.8.

1.2 ~~Plans and information~~ Documentation required for design review

1.2.2 **Machinery spaces**. Plans showing the general arrangement of the machinery spaces~~, together with a description of the propulsion system, main and emergency electrical power supply systems and steering arrangements~~ are to be submitted. The plans are to indicate segregation and access arrangements for machinery spaces and associated control rooms/stations.

1.2.7 **Installed prime mover capacity and installed propulsion systems**. System Operational Concept and System Design Description documents covering the propulsion system, main and emergency electrical power supply systems and steering arrangements are to be submitted. The System Operational Concept for the Propulsion systems is to include ~~A~~ a schedule of the propulsion equipment and systems and their operating capacity and capability under normal and foreseeable failure conditions i~~s to be submitted~~.

Volume 3, Part 1, Chapter 4
Manoeuvring Assessment

Effective Date 1 January 2015

■ *Section 1*
General

1.1 Application

~~*1.1.7* Requirements additional to those in this Chapter may be imposed by the Naval Authority.~~

1.3 Information and ~~Plans to be Submitted~~ Documentation required for design review

1.4 Sister ships

1.4.5 For a sister ship to a ship carrying the **LNMA** the ship will be required to verify performance at sea trials. The manoeuvres to be conducted are to be agreed between LR, the Owner and the Naval Administration in the sea trial procedures.

■ *Section 3*
Assessment for LNMA notation

3.1 General

3.1.3 The model tests are to be carried out by a ~~suitable~~ recognised organisation ~~recognised by LR and the Naval Administration~~ and a report is to be submitted to LR detailing the test arrangements, schedule of tests and results presented in both diagrammatic and tabular form.

3.2 Manoeuvring performance criteria

3.2.6 **Self berthing**, *see* Table 4.3.1, optional as ~~required by the Naval Administration~~ specified by the Owner. The vessel shall be capable of moving transversely at a speed of C6 knots with zero rate of rotation.

3.2.7 **Acceleration ability**, *see* 5.12 and Table 4.3.1, optional as ~~required by the Naval Administration~~ specified by the Owner. The time to accelerate to maximum ahead speed shall not exceed C7 seconds.

3.2.8 **Rate of turn**, *see* Table 4.3.1, optional as ~~required by the Naval Administration~~ specified by the Owner. The rate of turn during the period between the initiation of the manoeuvre and the point which is reached in 5.4.3(b) is not to be less than C8 degrees per second per knot, based on speed of entry into turn.

3.2.9 **Turning from rest**, *see* 5.13 and Table 4.3.1, optional as ~~required by the Naval Administration~~ specified by the Owner. This requirement relates to NS3 ships, specifically ships directly engaged in mine clearance. The time from order execute to a 90° change of heading while accelerating from rest is not to exceed C9 seconds.

(*Part only shown*)
Table 4.3.1 Recommended manoeuvring criteria

NOTES
1. Excluding ships directly engaged in mine clearance.
2. For ships directly engaged in mine clearance.
3. Rate applicable for ships engaged in mine hunting.
4. Rate applicable for engaged in minesweeping.
5. Where the displacement of the ship exceeds 10 000 tonnes, this criterion may be ~~relaxed with the agreement of the Naval Authority.~~ specially considered.

3.3 Wheelhouse poster and manoeuvring booklet

3.3.3 The format, data and content of the wheelhouse poster and the manoeuvring booklet are to meet the requirements of the ~~Naval Administration~~ specified standards.

3.4 Manoeuvring information card

3.4.2 The format and data to be presented on this card are to satisfy the requirements of the ~~Naval Administration~~ specified standards.

■ *Section 4*
Verification trials

4.4 Approach conditions

4.4.2 The approach speed for the assessment under Section 3 (**LNMA** notation) is to be at least 100 per cent of the ship's speed unless otherwise specified ~~by the Naval Administration~~.

4.6 Representative manoeuvres (LNMA notation)

4.6.1 Specific manoeuvres are to be carried out to an agreed trials code. The scope of the manoeuvres is to be agreed between LR, the ~~designer/Builder~~ Owner and the Naval Administration in the sea trials procedures.

■ *Section 5*
Guidelines on conducting ship verification trials

5.9 Spiral manoeuvring trials

(*Part only shown*)

5.9.5 The reverse spiral manoeuvre is to be conducted as follows:

(c) The recommended constant rates of turn are defined as percentages of the steady state rate of turn, *r*, derived from the turning circle, as shown in Table 4.5.2. For the **LNMA** notation ~~the Naval Administration may advise on the requirements for~~ specific constant rates of turn may be specified.

Volume 3, Part 1, Chapter 5

Replenishment at Sea (RAS) Systems

Effective Date 1 January 2015

■ *Section 1* General requirements

1.1 Application

1.1.3 The extent of RAS systems and facilities are subject to agreement between the designer and Owner~~/Operator~~. The classification approval process will involve assessment of the safety of the proposed facilities from concept to through life operability and de-commissioning. RAS operations are extremely hazardous and those involved in the development of such systems need to address safety issues to minimise the risks to the ship, personnel and the environment. Operational procedures and regular crew training are essential to minimise these risks and to reduce hazards to as low as reasonably practicable.

~~*1.1.4* The Naval Authority may impose requirements additional to those in this Chapter.~~

Existing paragraph 1.1.5 *has been renumbered* 1.1.4.

■ *Section 2* Principles

2.3 Class notations

2.3.2 Where ships comply with NATO replenishment at sea requirements, the requirements of this Chapter will be eligible for an additional character (**NT**) following any of the notations described in 2.3.1. The ~~Naval Authority is to identify the~~ relevant standard(s) (STANAG(s)) for assignment of the (**NT**) notation are to be specified with reference to the arrangements being applied from 2.3.1. Assessment for compliance with the identified standard will address the safety and design/ operating principles in these Rules.

■ *Section 3* Acceptance criteria

3.1 General

3.1.3 Conformance with the performance criteria, together with any specific requirements of the applicable Rules, standards and legislation is to be demonstrated by the designer/Builder and Owner~~/Operator~~ to the satisfaction of LR.

3.1.4 For RAS operations, the applicable Rules, Standards for classification are:

(a) LR *Rules for the Classification of Naval Ships*.
(b) LR's *Code for Lifting Appliances in a Marine Environment*.
(c) ~~Requirements of the Naval Authority, see 3.1.5.~~ Additional requirements of the Naval Administration, as specified.
(d) Owner~~/Operator~~ specified requirements. These are to be identified before commencement of the design review or construction.
(e) Standards for transfer hoses.
(f) LR Type Approval System.
(g) LR Quality Scheme for Machinery.

~~*3.1.5* Where LR is acting on behalf of the Naval Authority, any relevant requirements of the Naval Authority are to be identified and advised to LR.~~

■ *Section 4* Design and construction

4.1 General

4.1.1 Documents relevant to the design, construction, installation, testing and operation of RAS systems are:

(a) LR's Rules for RAS systems.
(b) The equipment manufacturer's recommendations.
(c) NATO Replenishment at Sea documents where specified by the Owner~~/Operator~~.

4.1.2 The overall performance of RAS systems is to be demonstrated to conform ~~with~~ to the performance criteria specified in the ~~design statement~~ System Operational Concept.

■ *Section 5* Plans and particulars to be submitted

5.1 Plans and information

(*Part only shown*)

5.1.2 ~~**Design statement.**~~ **System Operational Concept**. A ~~design statement~~ System Operational Concept of the RAS systems that details the capability and functionality under defined operating and emergency conditions. The ~~design statement~~ System Operational Concept is to be agreed between the designers and Owners~~/Operators~~ and is to include as applicable:

(*Part only shown*)

5.1.3 **Engineering and safety justification**. An engineering and safety justification for the RAS systems stating design standards used, assumptions made and any technical evidence. The justification is to:

(h) Limits are to be defined in terms of lateral separation between vessels, ship's speeds, wind force, sea conditions (wave height, period and direction) and environmental conditions (visibility). The validation of potential operational scenarios may be by using a set of generic ship types agreed between the Owner~~/Operator~~ and the designer.

(n) Address the disabling of automatic control, protection and safety functions for machinery and engineering systems where these are considered essential during replenishment at sea activities. The arrangements are to be consistent with the requirements of Vol 2, Pt 1, ~~Ch 2,4.8.4~~ Ch 2,4.9.4.

Where applied standards are not in the public domain, e.g., ATP 16 (latest version) covering NATO Replenishment at Sea, a copy is to be included with the engineering and safety justification.

5.1.4 **General arrangement plan**. A general arrangement plan of the ship showing the following information:

(a) Position of each RAS station, with identifiable reference to the engineering and safety justification and ~~design statement~~ System Operational Concept.
(b) The tasks to be carried out at each RAS station.
(c) Position of observation and control positions.
(d) Arcs of fields of view and operation from each of the observation and control positions and RAS stations.

5.1.10 **Testing and trials procedures**. A schedule of testing and trials to demonstrate that systems are capable of operating as described in the ~~design statement~~ System Operational Concept. The testing and trials procedures are to include details of through life load testing which includes the periodicity of load testing for different items of equipment.

■ *Section 6*
Ship and arrangement requirements

6.1 Location of RAS stations and equipment

6.1.1 Designated RAS stations are to be provided for RAS operations. RAS stations are to be positioned on the Supplying Ship to maximise compatibility with Receiving Ships and such that, as far as possible, the effects of hull interaction between the Supplying and Receiving Ships are minimised. For some types of naval ships, a reception point for the replenishment of ammunition may be required on the fo'c'sle. The number, type and location of the RAS stations are to be agreed between the designer and Owner~~/Operator~~ but as a guide, for NS1 and NS2 type ships, it is usual practice to have up to six abeam RAS stations (three on the port side and three on the starboard side) located symmetrically about the ship's centre line. *See also* 4.2.1.

6.1.6 The location of all rigging securing points is to comply with the equipment manufacturer's requirements and agreed between the designer and Owner~~/Operator~~.

6.5 Location and layout of stores

6.5.1 The number, type and location of stores are to be consistent with the routes leading to/from RAS stations. The layout of each store is to recognise the need rapidly to strike down equipment and provisions and ~~are~~ is to be agreed between the designer and Owner~~/Operator~~.

6.6 Ship's structures

6.6.3 The location of the dump area and/or dispatch area within the RAS station is to be agreed between the designer and Owner~~/Operator~~ and is to centre on the high point where applicable.

■ *Section 7*
Ship operating system requirements

7.1 Bridge conning position

7.1.1 A conning location for the officer in charge of RAS operations is to be provided on the navigating bridge with a duplicated position on both bridge wings. The location is to be agreed between the designer and Owner~~/Operator~~ and be included in the ~~design statement~~ System Operational Concept.

7.1.3 ~~The Naval Authority may require~~ Where specified an additional emergency conning position for use in the event of the bridge conning position being out of service may be required. The agreed location and arrangements are to be agreed between the designer and Owner~~/Operator and included in the design statement~~ and are to be specified in the System Operational Concept.

7.4 Communications, signals and navigational aids

7.4.1 Arrangements for ship internal communications during RAS operations are to be provided. The communication equipment and systems are to be arranged to permit safe and effective communications throughout the RAS operations to all parties identified in the engineering and safety justification and the ~~design statement~~ System Operational Concept.

7.4.4 Ship to ship communication protocols and standards are to be specified and agreed between the designer and Owner~~/Operator~~.

7.4.7 If distance lines and sound-powered communication equipment, as specified by the Owner~~/Operator~~, are to be passed between the ships that are to undertake RAS operations, the following criteria are to be complied with:

(a) The positions of the communications equipment tie down/securing points and connections are to be agreed between the designer and Owner~~/Operator~~ and shown on the RAS general arrangement plan.
(b) Distance line securing points are to be clear of all RAS stations and positioned so the distance line is readily visible from the RAS officer's conning position. The exact locations for securing the distance lines are to be agreed between the designer and Owner~~/Operator~~ and shown on the RAS general arrangement plan.

7.4.8 The communication system requirements between receiving ship, delivery ship and helicopter during VERTREP operations are to be ~~agreed between the designer and Owner/Operator and be in accordance with Naval Authority requirements.~~ specified by the Owner.

7.5 RAS operations

7.5.3 RAS systems are to be designed and installed such that they do not degrade from defined criteria (for equipment and the ship) stemming from susceptibility to magnetic interference sources that may include military activities. Systems are to comply with the technical requirements of IEC 60533: *Electrical Installations in Ships, electromagnetic Compatibility*. Emission limits and immunity requirements are to be ~~agreed by the Naval Authority~~ specified by the Owner where those specified in IEC 60533 are not appropriate for the ship type.

7.5.4 Facilities and equipment to undertake RAS operations in darkness are to be ~~provided where the Naval Authority has agreed to such operations~~ specified. Typically this will require provision of low intensity red lighting at each RAS station and on the routes to/from the RAS station to the stores and within the stores to allow safe operations in darkness. The arrangements are to be agreed between the designer and Owner~~/Operator~~ and included in the ~~design statement~~ System Operational Concept. Provision is also to be made for suitable low intensity lighting at control panels for operating RAS equipment.

■ *Section 8*
RAS station requirements

8.1 General

8.1.4 The clear areas for VERTREP operations are to be agreed between the designer and Owner~~/Operator~~. Reference is to be made to international standards for helicopter operations and the helicopter's capability requirements. The following are to be specified:

(a) Helicopter types.
(b) Underslung load earthing equipment/facilities.
(c) Range (size and weight) of cargo.
(d) Minimum clearance criteria.
(e) Lighting standards/requirements.
(f) Painting standards/requirements.
(g) Deck conductance for dissipation of static charge.

8.1.10 Where the ~~Naval Authority has defined~~ Owner has specified military requirements relating to radar cross-section, the increased cross-section from exposed deck machinery and fittings is to be assessed with such equipment being recessed wherever practicable.

■ *Section 10*
Transfer of solids

10.1 General

10.1.2 For ships intended for receiving solid supplies, the design of arrangements is to provide for rapid removal of cargo from the RAS station once received on board. The arrangements and equipment are to recognise the reception of large and/or heavy items of cargo and the number of crew required. A typical maximum transfer rate is 25 pallets (each pallet up to 2 tonnes) every hour in fair weather conditions. The design transfer rate is to be agreed between the Owner~~/Operator~~, designer and LR.

10.1.4 Equipment intended for transfer of solids is to be capable of handling the maximum size and weight of solids identified in the ~~design statement~~ System Operational Concept.

■ *Section 11*
Transfer of personnel

11.1 General

11.1.1 Arrangements for the transfer of personnel are to be in accordance with ~~Naval Authority requirements~~ a specified standard.

11.1.2 Unless specified ~~specifically approved by the Navy~~, only manually powered equipment is to be installed for the transfer of personnel.

■ *Section 12*
RAS equipment

12.1 General

12.1.1 The types of transfer that the ship is required to undertake are to be specified by the Owner~~/Operator~~ and the selection of equipment is to be agreed between the designer and Owner~~/Operator~~.

12.1.2 It is the responsibility of the ~~Client~~ Builder to demonstrate the equipment is designed, manufactured, installed and tested in accordance with the applicable Rule requirements.

■ *Section 13*
Testing and trials

13.1 General

13.1.1 Testing and trials are to be carried out to LR's satisfaction to demonstrate that systems and equipment operate and function as stated in the ~~design statement~~ System Operational Concept.

Volume 3, Part 1, Chapter 6
Buoyancy, Stability and Controllability Assessment

Effective Date 1 January 2015

■ *Section 1*
General

1.1 Application

1.1.5 A suitable subdivision and damaged stability standard, which complies with the performance requirements of Chapter III of the NSC, is to be specified ~~by the Naval Authority and agreed with LR~~, see Vol 1, Pt 1, Ch 2,1.1.9.

1.1.6 A suitable intact stability standard which complies with the performance requirements of Chapter III of the NSC is to be specified ~~by the Naval Authority and agreed with LR~~, see Vol 1, Pt 1, Ch 2,1.1.9.

1.1.7 Where the ~~Naval Authority~~ Owner requires specific extreme damage or extreme flooding events to be assessed, over and above the events inherent in the standards above, those extreme events are to be ~~defined~~ specified in the ~~CONOPS~~ Concept of Operations (ConOps).

1.1.8 A sea-keeping analysis or model tests are to be undertaken, see 2.4.1. The range of environmental conditions used in the analysis or tests ~~are~~ is to be consistent with the ~~CONOPS~~ ConOps (e.g., specific headings for aircraft operations).

1.2 ~~Information and plans~~ Documents required for design review

1.2.1 Information required to be submitted:

(a) Information regarding operation of the vessel:
  - ~~CONOPS~~ ConOps.
  - Seakeeping analysis report or model test results.

(b) Information required to be submitted for approval:
  - C11(N).
  - Stability Information Book, see 2.5.1.

(c) Information regarding the ship's equipment:
  - A register of essential life-saving equipment.

■ *Section 2*
Requirements

2.2 Reserve of buoyancy

2.2.1 LR will verify compliance with the agreed subdivision and damaged stability standard. Where ~~the Naval Authority specifies an exception to the standard or~~ alternative arrangements or non-compliances with the agreed standard occur, they are to be recorded in the tailoring document, *see* Vol 1, Pt 1, Ch 2,3.11.

2.3 Reserve of stability

2.3.1 LR will verify compliance with the agreed intact stability standard. Where ~~the Naval Authority specifies an exception to the standard or~~ alternative arrangements or non-compliances with the agreed standard occur, they are to be recorded in the tailoring document, see Vol 1, Pt 1, Ch 2,3.11.

2.4 Safety of embarked persons

2.4.1 The results of the sea-keeping analysis or model test are to demonstrate that the predicted RMS motions, deck wetness, Motion Induced Interruptions (MII) and Motion Sickness Incidences (MSI) for the design are within the limits specified in STANAG 4154 or another ~~appropriate~~ specified standard ~~specified by the Naval Authority~~. Values are to be predicted or recorded at the following locations as a minimum, where applicable:

- Navigation bridge.
- Machinery control room.
- Flight deck.
- RAS operating positions.
- Well-deck.

2.4.4 Guard rails ~~and~~, handrails and safety points are to be visually inspected and tested through life at intervals specified by the Naval Administration. The tests are to be undertaken by a Responsible Person in accordance with an appropriate standard agreed with the Naval Administration.

2.4.5 A log of visual inspections and testing is to be maintained on board the vessel and updated by the Responsible Person. Where guard rails ~~or~~, handrails or safety points are found to be deficient, the deficiency is to be reported to the appropriate maintainer. At Annual Survey the Surveyor is to satisfy themself that the visual inspection and testing is being undertaken and that the log is being updated appropriately.

Volume 3, Part 2, Chapter 1
Noise and Vibration Levels in Personnel Spaces

Effective Date 1 January 2015

■ *Section 1* General requirements

1.1 Scope

1.1.5 These Rules recognise existing national and international Standards and specify levels of noise and vibration currently achievable using good engineering practice. Compliance with these requirements will be assessed by review of procedures, inspection and measurement of the relevant parameters. Pre-survey reviews, inspections and measurements will be conducted, witnessed or assessed by Lloyd's Register (hereinafter referred to as 'LR') Surveyors. All vessels can apply for Acceptance Numerals 1 and 2.

1.1.7 The sound pressure levels for audible alarms and public address systems fitted in accordance with other ~~sections~~ Sections of the Rules are to satisfy IMO Resolution A.1021(26)(19) *Code on Alerts and Indicators, 2009* ~~Alternative arrangements may be acceptable provided they are acceptable to the Naval Authority.~~ or other specified arrangements.

~~*1.1.8* Requirements additional to these in this Chapter may be imposed by the Naval Authority.~~

■ *Section 2* Noise

2.1 Maximum noise levels

2.1.2 Guidance on maximum acceptable sound pressure levels and noise exposure limits is given in IMO Resolution ~~A.468(XII)~~ MSC.337(91).

2.2 Crew and embarked personnel accommodation and work areas

Table 1.2.2 Work areas – Maximum noise levels

Location	dB(A) level
Machinery space (continuously manned) ~~e.g., stores~~	90
Machinery space (not continuously manned) e.g., pump, refrigeration, thrusters or fan rooms	110
Workshops and non-specified work spaces	85
Machinery control rooms	75
Wheelhouse, conning positions and operational control rooms	65
~~Bridge wings, additional limits:~~	
~~250 Hz octave band~~	~~68 (linear)~~
~~500 Hz octave band~~	~~63 (linear)~~
~~Listening posts, including navigating bridge wings and windows~~	
Look-out posts e.g., at bridge wing or window	70
Additional limits:	
—250 Hz band	68
—500 Hz band	63
(measured according to IMO A.343(IX))	
Radio rooms	60
Galleys and pantries:	
Equipment not working	75
Individual items at 1 m	85
Normally unoccupied spaces (e.g., holds, decks)	90
Ship's whistle, on bridge wings or forecastle	110

2.3 Acoustic insulation

2.3.1 Acoustic insulation of bulkheads and decks between crew spaces is to be in accordance with the requirements of IMO Resolution ~~A.468(XII)~~ MSC.337(91).

■ *Section 4* Testing

4.3 Noise measurements

4.3.1 Noise measurements are to be conducted in accordance with ISO 2923 and IMO Resolution ~~A.468(XII)~~ MSC.337(91). Measurements of noise levels are to be carried out using precision grade sound level meters conforming to IEC ~~651~~ 60651, Type 1 or 2. Subject to demonstration, equivalent standards are acceptable.

■ *Section 5*
Survey reporting

5.2 Noise

(*Part only shown*)

5.2.1 The reporting of results is to comply with ISO 2923 and IMO Resolution MSC.337(91), and is to include:

(a) The results of public address and general alarm system testing, in addition to the acoustic insulation testing.

■ *Section 8*
Referenced standards

8.1 Noise

(*Part only shown*)

8.1.1 The following National and International Standards for noise are referred to in these Rules:

- ~~IMO Resolution A.468(XII), *Code on noise levels on board ships*.~~
- IMO Resolution MSC.337(91), *Adoption of the code of noise levels on board ships*.

Volume 3, Part 2, Chapter 2
Environmental protection

Effective Date 1 January 2015

■ *Section 1*
General requirements

1.1 Application

~~*1.1.3* Additional requirements may be imposed by the Naval Authority. If specifically requested, Lloyd's Register (hereinafter referred to as 'LR') may provide suitable certification or statement of compliance.~~

Existing paragraphs 1.1.4 *to* 1.1.5 *have been renumbered* 1.1.3 *to* 1.1.4.

1.3 ~~Alterations and additions~~ Documentation required for design review

■ *Section 2*
ENV characters

2.3 Grey water and sewage – GW character

2.3.4 Where it is intended that the effluent of the grey water treatment plant be re-used or recycled for any purpose, the effluent is to meet the potable water quality standards of the ~~Naval Authority~~ Naval Administration.

■ *Section 3*
Survey requirements

3.3 Change of ~~Naval Authority~~ Naval Administration

3.3.1 Where the ~~Naval Authority~~ Naval Administration changes, the ENV notation will be suspended.

3.3.2 The new ~~Naval Authority~~ Naval Administration may adopt the previously approved procedures as required by these Rules or may compile new procedures which would need to be submitted for approval.

Volume 3, Part 2, Chapter 3
Provision Refrigeration

Effective Date 1 January 2015

■ *Section 1*
General requirements

1.1 General

~~*1.1.3* The Naval Authority may impose requirements additional to those in this Chapter.~~

Existing paragraph 1.1.4 *has been renumbered* 1.1.3.

1.2 ~~Plans and information~~ Documentation required for design review

1.2.2 ~~**Design statement.**~~ **System Design Description.** A ~~design statement~~ System Design Description, *see* Pt 1, Ch 3,3.5 of the refrigeration system(s) that details system capability and functionality under defined operating and emergency conditions within the normal concept of operation role of the ship. The arrangements for refrigerated stores for the ship are to be agreed between the designer and the Owner~~/Operator~~ and are to be ~~included~~ specified in the ~~design statement~~ System Design Description.

■ *Section 2*
Construction and installation

2.2 Equipment – Selection and installation

2.2.1 Pressure vessels in provision refrigeration systems are to be in accordance with Vol 2, Pt 8, Ch 2 or ~~an alternate recognised Code and satisfy the Naval Authority's revalidation system for such items where applicable~~ a recognised Code.

2.4 Refrigerant systems

2.4.1 Refrigeration plants are to be provided and designed to be capable of extracting the defined heat load duty when operating in accordance with the conditions stated in the ~~design statement~~ System Design Description required by 1.2.2.

2.4.10 Sea-water systems for refrigeration condensers are to be capable of being supplied from not less than two independent sources. If ~~required by the Naval Authority~~ specified, these sources are to be located in separate compartments and zones such that the loss of one zone or compartment will not result in the loss of all sea-water supply sources.

2.4.11 The capacity of each source of ~~sea-water~~ seawater required by 2.4.10 is to be sufficient for the conditions stated in the ~~design statement~~ System Design Description with any one source out of action.

2.5 Air coolers and cooling grids

2.5.1 Refrigerated spaces may be cooled by air coolers or cooling grids on the deck head, bulkheads, and sides. In order to minimise the dehydration of the stores and the frosting of the air coolers or cooling grids, the installation is to be designed to maintain the required temperatures as defined in the ~~design statement~~ System Design Description with a minimum of difference between the refrigerant and space temperatures.

2.5.2 The refrigeration capacity of the air cooler arrangement is to be such that the provisions room temperature conditions defined in the ~~design statement~~ System Design Description can be maintained under normal operating conditions. The capacities of the fans are also to be such that they can maintain the required air flow rates and uniform air temperature throughout the refrigerated spaces, when part or fully loaded with stores.

■ *Section 7*
Testing and trials

7.3 Trials

7.3.1 Trials are to be carried out to demonstrate that the capability of the provision refrigeration systems meets the ~~design statement~~ System Design Description. The trials are as far as practicable to be representative of the actual conditions to be encountered in service.

Volume 3, Part 3, Chapter 1

General Requirements

Effective Date 1 January 2015

Section 1

Scope

1.1 Application

1.1.1 The Chapters in this Part of the Rules define the requirements for the design and service life of safety equipment and arrangements. The Chapters are provided for the purpose of assessing that the levels of safety (of crew and embarked personnel) and pollution prevention on board a naval ship are to a standard which is acceptable to the ~~Naval Authority~~ Naval Administration and Lloyd's Register (hereinafter referred to as LR). The Rules provide a standard that can be considered to be as far as reasonably practicable in accord with the applicable IMO International Conventions but take due cognisance of military application. They also provide a methodology for assessing the suitability of designs that deviate from generally accepted practice.

~~*1.1.3* Attention is also to be given to any relevant requirements of the Naval Authority.~~

Existing paragraphs 1.1.4 *to* 1.1.6 *have been renumbered* 1.1.3 to 1.1.5.

~~*1.1.4*~~ *1.1.3* These Rules are applicable only to ships carrying crew and embarked personnel. The carriage of passengers is considered novel for most naval ships and will generally only be undertaken during emergency situations or where specially agreed by the ~~Navy~~ Owner. The carriage of passengers is therefore outside the scope of these Rules. Special consideration will be given to arrangements where passengers are carried ~~and will be subject to agreement by the Naval Authority~~.

1.2 Background

1.2.1 These Rules provide a framework and methodology for demonstrating that levels of safety and pollution prevention are to a standard acceptable to the ~~Naval Authority~~ Naval Administration and LR. The application of these Rules is not to compromise the levels of safety afforded to naval ships through the application of current regulatory regimes and military practices. The Rules recognise military design, construction, installation, testing, trials and through life operation and take due account of the military function of naval ships. The Rules provide a series of optional class notations that can be assigned to designs complying with relevant Parts of the Rules.

1.4 Topics within this Part of the Rules

1.4.8 **Double Star Endorsements** (★★). All Class Notations that are available in Chapters 2, 3 and 4 of this Part of the Rules will be eligible for a 'Double Star' endorsement where the arrangements on board are in accordance with ~~stated Naval Authority~~ the requirements ~~and~~ of *ANEP-77 NATO Naval Ship Code* (NSC) plus any Naval Administration requirements as specified. ~~This does not necessarily denote automatic endorsement by the Naval Authority.~~

Section 2

General Information

2.1 Responsibilities

~~*2.1.1* The Naval Authority is responsible for defining the regulations and requirements associated with the design, procurement, installation and support of equipment and systems within the scope of application of this Part of the Rules. *See* Vol 1, Pt 1, Ch 2,2.2.6 for definition of Naval Authority.~~

Existing paragraphs 2.1.2 *to* 2.1.6 *have been renumbered* 2.1.1 *to* 2.1.5.

~~*2.1.4*~~ *2.1.3* The ~~Naval Authority~~ Naval Administration is responsible for confirming that the equipment and arrangements are acceptable to them for recognition of the requirements associated with a particular class notation with a Double Star (★★) endorsement, *see* 1.4.8.

~~*2.1.5*~~ *2.1.4* The **designer** is responsible for co-ordination of all matters relating to demonstrating compliance with the Rules and any requirements of the Naval ~~Authority and National~~ Administration as specified by the Owner.

~~*2.1.6*~~ *2.1.5* The **Owner** has ultimate responsibility for ensuring a safety standard acceptable to the ~~Naval Authority~~ Naval Administration is being applied, *see also* Vol 1, Pt 1, Ch 2,1.4.

2.2 Appraisal and review

2.2.1 Prior to the formal appraisal process being commenced a ~~concept statement~~ System Operational Concept is to be submitted and agreed with LR, *see* 2.3.2.

2.2.3 All systems are to be constructed and assembled from equipment suitable for its intended purpose and acceptable to the National Administration and/or the ~~Naval Authority~~ Naval Administration where a 'Star' or 'Double Star' endorsement is required. Such equipment will typically have a relevant Type Approval Certificate or an EC Marine Equipment Directive Certificate issued by LR or an organisation acceptable to LR. Equipment with other certification may be acceptable as an alternative subject to a satisfactory review by LR. Details will be noted as an Annex in the applicable certification or class documentation, *see* 1.3.1.

2.3 ~~Plans and information~~ Documentation required for design review

2.3.1 The Concept of Operations including the ship's civil and military operational profile specifying the functionality and capability in defined operating and foreseeable failure conditions of the ship is to be submitted. This is to be provided by the ~~agreed between the designer and~~ Owner~~/Operator~~.

2.3.2 A ~~Concept Statement~~ System Operational Concept detailing the capability and functionality of the system under consideration detailing defined civil and military operating and emergency conditions is to be submitted. The ~~Concept Statement~~ System Operational Concept is to include but is not limited to:

(a) Required Certificates of Compliance or Class Notations.
(b) Description of the ship's operational capabilities, ~~(Concept of Operations)~~ to include any defined military survivability requirements.
(c) Details of the intended mode of operation of the equipment/system to include environmental conditions.
(d) Manning levels and operator competencies/authorisations required.
(e) Indication of whether or not alternative design assessment is being sought if the proposed design deviates from the specified guidance identified in these Rules.

(*Part only shown*)
2.3.3 In addition to the submission of an acceptable ~~Concept Statement~~ System Operational Concept, a more detailed Design Disclosure is required for submission to and acceptance by LR. The Design Disclosure is to include, but is not limited to:

2.3.4 Where a ~~Naval Authority~~ Naval Administration has approved equipment, systems and arrangements which are usually subject to these Rules for Classification purposes, full details are to be submitted to LR for information. Details are to include information on the equipment/arrangements, certification and test reports.

■ *Section 4*
Integration for EER notation

4.2 System integration

4.2.1 System integration is to be managed by a single designated party, and is to be carried out in accordance with a defined procedure, agreed between the designer and the Owner~~/Operator~~.

■ *Section 6*
Route to conformance

6.1 Route to conformance

6.1.3 The route to conformance throughout the life-cycle requires the following:

(a) **Design**. Plans are to be appraised by LR when required by the Rules and where a military distinction notation has been requested by the Owner.
(b) **Construction**. To be constructed under survey where required by the Rules.
(c) **Installation**. Systems are to be installed under survey in accordance with plans appraised by LR and with Rule Requirements.
(d) **Trials**. Systems are to be tested under normal working conditions.
(e) **In Service**. Systems will be subject to survey where required by the Rules or Regulations or where requested by Owners or ~~Naval Authority~~ Naval Administration.
(f) **Modification**. Details of any modifications are to be appraised and construction, installation and trials are to be carried out under survey when required by the Rules for a Class notation.
(g) **Decommissioning**. Details are to be submitted for information.

Volume 3, Part 3, Chapter 2
Fire Protection

Effective Date 1 January 2015

■ *Section 3*
~~Plans and particulars~~ Documentation required for design review

3.1 ~~Concept statement~~ System Operational Concept

3.1.1 The design intent of any fire protection system is to be submitted in the form of a ~~Concept Statement~~ System Operational Concept and is to include but not be limited to:

(a) The required class notation, **FIRE**, **FIRE★** or **FIRE★★** . If a military distinction (**MD**) notation is required this is also to be declared, *see* Vol 1, Pt 1, Ch 2,3.7.

~~(b) A Concept of Operations which is a description of the ship's designed operational role and capabilities and is to include any defined military survivability requirements.~~

~~(c)~~(b) Details of the intended mode of operation of the fire protection systems/equipment to include environmental conditions together with a description of any fire scenarios and their development and application in the design.

~~(d)~~(c) Manning levels, drills, exercises and operator competencies/authorisations required.

~~(e)~~(d) Indication of whether or not alternative design assessment is being sought, if the proposed design deviates from the specified guidance identified in these Rules.

The ~~concept statement~~ System Operational Concept is to be agreed by the designer and Owner~~/Operator~~, *see also* Ch 1,2.3.2.

3.2 Design disclosure

(*Part only shown*)

3.2.1 In addition to submission of an acceptable ~~Concept Statement~~ System Operational Concept, a Design Disclosure is required for submission to and acceptance by Lloyd's Register (hereinafter referred to as 'LR'). The Design Disclosure is to include, but is not limited to:

■ *Section 7*
Fire extinction

7.1 Fire-extinguishing objective

(*Part only shown*)

7.1.2 Fire-Extinguishing Goal 1. Arrangements on board are to be such that all detected fires can be extinguished using a medium which is suitable for the nature of the fire.

(h) With regard to sprinkler systems, NS1 and NS2 ships, and those designed to carry in excess of 50 embarked personnel, are to be fitted with an automatic sprinkler, fire detection and fire alarm system ~~of a type acceptable to the Naval Authority~~ in accordance with the FSS Code or other agreed specified standard in all control stations, accommodation and service spaces. Alternatively, if a water sprinkler system may cause damage to essential equipment, ~~a~~ an agreed alternative fixed fire-fighting system ~~acceptable to the Naval Authority~~ is to be ~~used~~ specified. Spaces where there is little or no risk of fire need not be fitted with such a system.

(j) On NS3 ships and vessels designed to carry less than 50 embarked personnel, an automatic sprinkler, fire detection and fire alarm system ~~of a type acceptable to the Naval Authority~~ in accordance with the FSS Code or other agreed specified standard is to be installed to protect control stations. A fixed fire detection system and alarm is to be arranged to provide smoke detection in corridors, stairways, escape and access routes within accommodation spaces.

■ *Section 8*
Fire and by-product containment

8.1 Fire and by-product containment objective

(*Part only shown*)

8.1.2 **Fire-and By-product Containment Goal 1**. Adequate containment boundaries are to be fitted within the ship in order that spread of fire, smoke and toxic by-products is limited to a predetermined area, consistent with allowing as near normal operation of the vessel as practically possible in the event of fire, without evacuation.

(d) All controls for the fire-extinguishing system shall be situated in one control position or in as few positions as possible ~~to the satisfaction of the Naval Authority~~.

Volume 3, Part 3, Chapter 3
Escape and Emergency Access

Effective Date 1 January 2015

■ *Section 3*
~~Plans and particulars~~ Documentation required for design review

3.1 ~~Concept statement~~ System Operational Concept

3.1.1 The design intent of any escape and emergency access arrangements is to be submitted in the form of a ~~Concept Statement~~ System Operational Concept and is to include, but not be limited to:

(a) The required class notation, **ESC**, **ESC★** or **ESC★★**. If a military distinction (**MD**) notation is required this is also to be declared, *see* Vol 1, Pt 1, Ch 2,3.7.

~~(b) A Concept of Operations which is a description of the ship's operational capabilities and is to include any defined military survivability requirements.~~

(~~c~~b) Details of the intended mode of operation of escape and emergency access systems/equipment to include environmental conditions together with a description of any escape and emergency access scenarios and their development and application in the design.

(~~d~~c) Manning levels and operator competencies/authorisations required.

(~~e~~d) Indication of whether or not alternative design assessment is being sought, if the proposed design deviates from the specified guidance identified in these Rules.

The ~~concept statement~~ System Operational Concept is to be agreed by the designer and Owner~~/Operator~~, *see also* Ch 1,2.3.2.

3.2 Design disclosure

(*Part only shown*)

3.2.1 In addition to submission of an acceptable ~~Concept Statement~~ System Operational Concept, a Design Disclosure is required for submission to and acceptance by LR. The Design Disclosure is to include, but is not limited to:

■ *Section 4*
General requirements

4.1 The Rules

4.1.4 The escape routes are to be designed so as to support escape of all personnel to a designated place of safety. Where a pre-determined time for escape is specified in the Design Disclosure, based on the design and operational role of the ship then it is to be validated by full-scale trials or by a simulation acceptable to LR and the Naval Administration. ~~This time is to be specified by the Naval Authority based on the design and operational role of the ship. The time is to be validated by full-scale trials or by a simulation acceptable to the Naval Authority and LR, *see also* the *Naval Survey Guidance*.~~

Volume 3, Part 3, Chapter 4
Life-Saving and Evacuation Arrangements

Effective Date 1 January 2015

■ *Section 3*
~~Plans and particulars~~ Documentation required for design review

3.1 ~~Concept statement~~ System Operational Concept

3.1.1 The design intent of any life-saving or rescue system is to be submitted in the form of a ~~Concept Statement~~ System Operational Concept and is to include, but not be limited to:

(a) The required class notation, **LSAE**, **LSAE★** or **LSAE★★**. If a military distinction (**MD**) notation is required this is to be declared, *see* Vol 1, Pt 1, Ch 2,3.7.

~~(b) A Concept of Operations which is a description of the ship's designed operational role and capabilities and is to include any defined military survivability requirements.~~

(~~c~~b) Details of the intended mode of operation of life-saving and evacuation systems/equipment to include environmental conditions together with a description of any emergency scenarios and their development and application in the design.

(~~d~~c) Manning levels and Operator competencies/authorisations required.

(~~e~~d) Indication of whether or not alternative design assessment is being sought, if the proposed design deviates from the specified guidance identified in these Rules.

The ~~Concept Statement~~ System Operational Concept is to be agreed by the designer and Owner~~/Operator~~, *see also* Ch 1,2.3.

3.2 Design disclosure

(*Part only shown*)

3.2.1 In addition to submission of an acceptable ~~Concept Statement~~ System Operational Concept, a Design Disclosure is required for submission to and acceptance by Lloyd's Register (hereinafter referred to as 'LR'). The Design Disclosure is to include, but is not limited to:

3.3 ~~Plans~~ Documents required for design review

3.3.2 For life-saving appliances, the following plans and information:

(a) Certificates of conformity against the *International Life Saving Appliance Code* (MSC Res. 48(66)) or other specified standard acceptable to the ~~Naval Authority~~ Naval Administration and LR.

(b) General arrangement plans of equipment, detailing all essential parameters, weights, Safe Working Loads, etc.

■ *Section 4*
General requirements

4.1 The Rules

4.1.5 The evacuation systems are to be designed so as to support evacuation of all personnel in a pre-determined time. ~~This time is to be agreed by the Naval Authority based on the design and operational role of the ship. The time is to be validated by full-scale trials or by a simulation acceptable to the Naval Authority and LR. *See also* the Naval Survey Guidance.~~ Where a pre-determined time for evacuation is specified, based on the design and operational role of the ship then it is to be validated by full-scale trials or by a simulation acceptable to LR and the Naval Administration.

4.2 Life-saving and evacuation arrangements objectives

4.2.1 The objectives to be satisfied by all life-saving and evacuation systems are as follows:

(a) Evacuation Objective. Arrangements are to be provided to enable personnel to evacuate the ship safely and in a specified time ~~acceptable to the Naval Authority~~, *see* Section 5.

(b) Personnel Protection Objective. Evacuated personnel are to be kept protected until such time as they can be rescued from the survival craft, *see* Section 6.

(c) Rescue Objective. Every ship is to be suitably equipped to rescue personnel from the water, *see* Section 7.

(d) Command and Control Objective. Every ship is to be equipped and manned so that command of all evacuation and life-saving situations can be maintained, *see* Section 8.

■ *Section 5*
Evacuation of personnel

5.1 Evacuation objective

5.1.1 Arrangements are to be provided to enable personnel to evacuate the ship safely and in a specified time ~~acceptable to the Naval Authority~~. The Evacuation Goals described in 5.1.2 to 5.1.6 may be achieved by the application of the referred SOLAS Regulations and technical references which are for guidance purposes. *See also* 4.1.3.

(*Part only shown*)

5.1.4 Evacuation Goal 3. All life-saving and rescue equipment is to be of an approved type ~~acceptable to LR, the Naval Authority and National Administration where applicable~~ to specified standards:

(a) In general, all life-saving and rescue equipment prototypes are to be tested to confirm that they comply with the *International Life-Saving Appliance Code* or other standard acceptable to LR ~~and~~, the ~~Naval Authority~~ Naval Administration or National Administration.

■ *Section 6*
Personnel protection

6.1 Personnel protection objective

6.1.3 Personnel Protection Goal 2. Survival craft are to be equipped with sufficient provisions to keep personnel free from starvation and dehydration for a specified period of time ~~specified by the Naval Authority~~.

Volume 3, Part 3, Chapter 5
Safety of Navigation and Communication

Effective Date 1 January 2015

■ *Section 1* Scope

1.1 Philosophy

1.1.4 In addition to the requirements for ships to be furnished with the necessary equipment for effective navigation and communication, SOLAS requires the contracting Governments to provide certain shore-based facilities and services. These services assist the ships in maintaining effective navigation and communication. It is beyond the scope of these Rules to mandate that ~~the Navy's~~ a Government is to provide such services, however it must be noted that they are an essential part of the ship's operation.

■ *Section 3* ~~Plans and particulars~~ Documentation required for design review

~~3.1 Design statement~~

~~*3.1.1* The design intent of the communication and navigation arrangements is to be submitted and is to include all necessary supporting information with:~~

- ~~(a) the required class notation;~~
- ~~(b) details of the operational profile of the ship, to include manning provisions and training levels; and~~
- ~~(c) a description of each mode of operation of the systems in each identifiable operational state.~~

~~3.2~~ 3.1 ~~Engineering and safety justification~~ System Operational Concept

~~*3.2.1*~~ *3.1.1* The design intent of any communications and navigation system is to be submitted in the form of a ~~Concept Statement~~ System Operational Concept and is to include but not be limited to:

- (a) The required class notation, **SNC** or **SNC★** If a military distinction (**MD**) notation is required this is also to be declared. *See* Vol 1, Pt 1, Ch 2,3.7.
- ~~(b) Description of the ship's operational capabilities, (Concept of Operations) to include any defined military survivability requirements.~~
- (~~c~~b) ~~Details of the intended mode of operation of navigation and communication systems/equipment to include environmental conditions, to include a description of each mode of operation of the systems in each identifiable operational state including any emergency scenarios and their development and application in the design.~~
  Details of the intended mode of operation of navigation and communication systems/equipment including environmental conditions. They should also bear a description of each mode of operation of the systems in each identifiable operational state, including any emergency scenarios and their development and application in the design.
- ~~(d)~~(c) Manning levels and Operator competencies/authorisations required.
- ~~(e)~~(d) Indication of whether or not alternative design assessment is being sought, if the proposed design deviates from the specified guidance identified in these Rules.

The ~~concept statement~~ System Operational Concept is to be agreed by the designer and Owner~~/Operator~~, *see also* Ch 1,2.3.2.

Existing sub-Section 3.3 *has been renumbered* 3.2.

Volume 3, Part 3, Chapter 6
Pollution Prevention

Effective Date 1 January 2015

■ *Section 3* ~~Plans and Particulars~~ Documentation required for design review

3.1 ~~Design statement~~ System Design Description

3.1.1 The design intent of any pollution prevention system required by the regulations is to be submitted and is to include all necessary supporting information with:

(a) The required class notation, **POL**, or Certificate of Compliance to MARPOL Annex IV or VI. If a military distinction notation is required this is also to be declared.
(b) Details of the operational profile of the ship, to include manning provisions and training levels.
(c) A description of each mode of operation of the systems in each identifiable, potential pollution of the sea or air scenario~~s~~.

The ~~design statement~~ System Design Description is to be agreed by the designer and Owner~~/Operator~~.

3.2 Design ~~declaration~~ disclosure

3.2.1 In addition to submission of an acceptable ~~Concept Statement~~ System Design Description, a Design Disclosure is required for submission to and acceptance by Lloyd’s Register. The Design Disclosure is to include, but is not limited to:

(a) a statement of all design standards used in the design, manufacture, installation and testing of pollution prevention equipment and systems;
(b) a proposed list of all surveyable items together with any additional recommendations from equipment/component manufacturers. Evidence is also to be provided that all surveyable items of equipment have approval certificates;
(c) details of the proposed survey and maintenance regime;
(d) evidence of compliance with the Objectives and Goals defined in Sections 4 and 5. This may be in the form of compliance with prescriptive Rules, Concessions, Alternative Design Justification Reports or an acceptable combination of all three, *see also* Ch 1,2.3 and Ch 1,6;
(e) details of the Hazard Identification process and Class related hazards are to be submitted. A hazard identification system is to be in place at the design stage whereby all hazards identified are recorded. If application of these Rules has been identified as a hazard avoidance/mitigation measure then details are to be submitted;
(f) details of equipment configurations that are safe for operators and users;
(g) details of the proposed test procedure required to demonstrate functionality at the time of commissioning.

Cross-references

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Naval Ships.

Volume 3, Part 1, Chapter 3

1.1.9 now *1.1.8*	Reference to paragraph 1.1.8 *now reads* 1.1.7

Volume 3, Part 3, Chapter 5

3.3.1 now *3.2.1*	Reference to paragraph 3.3.2 *now reads* 3.2.2
3.3.1 now *3.2.1*	Reference to paragraph 3.3.3 *now reads* 3.2.3

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